



Department
for Environment
Food & Rural Affairs



Foreign &
Commonwealth
Office



Department
for International
Development



DPLUS036

Darwin Plus: Overseas Territories Environment and Climate Fund Project Application Form

Submit by Monday 4 August 2014

Please read the Guidance Notes before completing this form
Information to be extracted to the database is highlighted in blue

Basic Data			
1. Project Title (max 10 words)	Sustainable Management of Threatened Keystone Predators to Enhance Reef Resilience		
2. UK OT(s) involved	Cayman Islands		
3. Start Date:	01 April 2015		
4. End Date:	31 March 2017		
5. Duration of project (no longer than 24 months)	24 months		
Summary of Costs			
	2015/16	2016/17	Total
6. Budget requested from Darwin	106,204	67,235	173,439
7. Total value of matched funding	59,265	55,936	115,201
8. Total Project Budget (all funders)	165,469	123,171	288,640
9. Names of Co-funders	Department of Environment, George Town, Cayman Islands Guy Harvey Ocean Foundation, Florida, USA Caybrew Ltd., Cayman Islands Marine Conservation International		
10. Lead applicant organisation (responsible for delivering outputs, reporting and managing funds)	Marine Conservation International		
11. Project Leader name	Dr. Mauvis Gore		
12. Email address	mauvis.gore@mcinternational.org		
13. Postal address	5/6 Lang Rigg, South Queensferry, Edinburgh, EH30 9WN, U.K.		
14. Contact details: Phone/Fax/Skype			

* Notification of results will be by email to the Project Leader in Question 11

15. Type of organisation of Lead applicant. Place an x in the relevant box.									
OT GOVT	UK GOVT	UK NGO	<input checked="" type="checkbox"/>	Local NGO	International NGO	Commercial Company	Other (e.g. Academic)		

16. Principals in project. Please identify and provide a one page CV for each of these named individuals. You may copy and paste this table if you need to provide details of more personnel or more than 2 project partners.

Details	Principal Investigator	Deputy PI
Surname	Gore	Ormond
Forename(s)	Mauvis	Rupert
Post held	Co-Director	Co-Director
Institution (if different to above)	Marine Conservation International, Edinburgh, Scotland	Marine Conservation International, Edinburgh, Scotland
Department		
Telephone/Skype		
Email		

Details	Project Partner 1a	Project Partner 1b	Project Partner 2
Surname	Ebanks-Petrie	Austin	Harvey
Forename(s)	Gina	Tim	Guy
Post held	Director	Deputy-Director	Founder
Institution (if different to above)	Cayman Islands Government, George Town, Grand Cayman	Cayman Islands Government, George Town, Grand Cayman	Guy Harvey Ocean Foundation
Department	Department of Environment	Department of Environment	
Telephone/Skype			
Email			

Details	Project Partner 3	Project Partner 4
Surname	Shivji	Turner
Forename(s)	Mahmood	John
Post held	Professor	Senior Lecturer
Institution (if different to above)	Nova SE University, Fort Lauderdale, Florida, USA	Bangor University, Bangor, Wales, UK
Department	Oceanographic Centre / Guy Harvey Ocean Foundation	School of Ocean Sciences
Telephone/Skype		
Email		

17. Has your organisation been awarded Darwin Initiative funding before (for the purposes of this question, being a partner does not count)? If yes, please provide details of the most recent awards (up to 6 examples).

Reference	Project Leader	Title
14-005	Dr. Mauvis Gore	Conservation of Pakistan's Marine Cetacean Biodiversity and Pelagic Environment (Darwin Initiative funding: £167,308) <i>NB Same PI but affiliated to different organisation (University of London), thus details 3 other contracts provided below.</i>

18. If your answer to Q17 was No, provide details of 3 contracts previously held by your institution that demonstrate your credibility as an implementing organisation. These contacts should have been held in the last 5 years and be of a similar size to the grant requested in this application. (If your answer to Q17 was Yes, you may delete these boxes, but please leave Q18)

Contract 1 Title	OPEP CAY601/701: Cayman Sharks and Cetaceans: Network for Conservation Awareness / Managing the Resource
Contract Value	£148,587
Contract Duration	3 years
Role of institution in project	Implementing organisation
Brief summary of the aims, objectives and outcomes of the contract.	<p>The aim of these two interlinked projects was i) to determine the temporal and spatial occurrence of sharks & rays (elasmobranchs) and whales & dolphins (cetaceans) in the waters of the Cayman Islands, ii) to determine the threats to their populations, especially for scarce or endangered species, and iii) to develop recommendations on how best to exploit them sustainably (e.g. in whale & dolphin watching, shark diving or catch-and-release game-fishing). Two specific issues were investigated – the effects of potential shark feeding on shark behaviour and abundance, and the possible occurrence of tiger sharks in important recreational areas.</p> <p>The projects determined that 14 shark, 4 ray, 6 dolphin and 4 whale species occur regularly in Cayman, although none of the cetaceans appear resident. Spatial and seasonal variation in shark abundance was determined using basic Baited Remote Underwater Video Stations and scientific long-lining, with sharks appearing slightly more abundant than in much of the Caribbean, but much less abundant than in some countries where they are protected. Tagged sharks were found to range considerably further than expected, some Caribbean reef sharks between the islands, and tiger and oceanic white-tip sharks around the Caribbean Basin. As yet sharks are not protected except within Marine Protected Areas and our data suggest that their numbers are falling. A major public outreach programme was developed and a network of divers and voluntary observers established to report sightings. Socio-economic studies were undertaken demonstrating the very high economic value of living (as opposed to fished/dead) sharks. Along with scientific reports, a policy options document was prepared and submitted to public consultation, resulting in very high public support for establishing the Cayman Islands as a shark sanctuary.</p>
Client reference contact details (Name, e-mail, address, phone number).	<p>Gina Ebanks-Petrie Director of the Department of Environment, Cayman Islands Government, Georgetown, Grand Cayman. Tel:</p>

Contract 2 Title	Biology and Conservation of Basking Shark in Scotland
Contract Value	US\$ 191,000
Contract Duration	5 years
Role of institution in project	Implementing organisation
Brief summary of the aims, objectives and outcomes of the contract.	<p>Although a planktivore, the basking shark is the second largest fish globally. The aim of this series of annual grants from the Save Our Seas Foundation was to gain an understanding of its ecology and behaviour in Scottish and adjacent waters and promote its effective conservation.</p> <p>The work resulted in several key advances in knowledge of the species:</p> <p>Extensive survey work located a number of hotspots in the Inner Hebrides where the species aggregate to surface feed and show pre-courtship behaviour.</p> <p>A novel system for basking sharks was developed for recognising individual sharks from photographs of fins and other distinguishing features allowing the application of mark-recapture models to estimate temporary aggregation size as well as the likely scale of the regional super-population.</p> <p>The first international workshop on basking shark biology and conservation (2009) was held in the Isle of Man, in collaboration with the Manx Department of Agriculture Food & Fisheries.</p> <p>A public sightings scheme was established, and a basking shark photo-identification website established in collaboration with the UK Shark Trust (www.baskingshark.org).</p> <p>Tagging individuals with pop-off satellite tags revealed that some individual remain in Scotland until months after they may be observed at the surface, while others migrate much further. We established that these sharks cross the Atlantic.</p> <p>Satellite tags also showed that despite their name the sharks spend less than 10% of their time at the surface, and feed at a range of depths to over 1400 metres.</p> <p>Tissue samples were collected from living sharks and the full mitochondrial genome sequenced (in collaboration with Prof. Shivji at Nova Southeastern University) revealed population mixing between oceans.</p>
Client reference contact details (Name, e-mail, address, phone number)	<p>Dr. Chris Clarke, Current address: Danah Divers, Marine Centre, Obhur, Jeddah, Saudi Arabia. Tel:</p>

Contract 3 Title	Conservation of the Coastal Marine Environment of the Jeddah Region (Makkah province, Saudi Arabia)
Contract Value	Sub-contract approx £180,000 (total project budget £425,000)
Contract Duration	3 years
Role of institution in project	Advice and implementation

<p>Brief summary of the aims, objectives and outcomes of the contract.</p>	<p>The Red Sea is famous for its marine life, and in particular its coral reefs. These reefs are of great value not only from a conservation point of view, but because of the actual and potential economic benefits they bring, especially through tourism and fisheries (notably in countries such as Egypt and Sudan). However, over the last two decades there has been a general decline in the condition of the Red Sea's marine and coastal environment, as a result of coastal development, tourist activities, pollutant discharges and global-warming related coral bleaching. The abundance and diversity of corals has declining markedly in some areas. In particular the coral reefs of the Jeddah region (Makkah Province) of Saudi Arabia have been seriously impacted by development, including wholesale infilling and construction over the fringing reefs, unregulated fishing and widespread discharge of untreated sewage. This ongoing project is intended to complement the efforts of the various government agencies and non-governmental organisations to promote rehabilitation of these reefs and sustainable management of the associated marine resources.</p> <p>The goals of the project are:</p> <ul style="list-style-type: none"> • to assess the current status of the coastal marine environment (of the Makkah Province) through evaluating, qualitatively and quantitatively, the environmental hazards threatening the coastal marine environment. • to suggest effective measures for rehabilitating the coastal marine environment and restoring its natural resources. • to achieve suitable means of applying the concept of sustainable development of the coastal environment. • to raise the level of awareness among different stakeholders for the need for protection and conservation of the coastal marine environment. <p>The project is being undertaken in collaboration with staff of the Faculty of Marine Science of King Abdul-Aziz University, Jeddah. Six senior academic staff are participating, supported by some 10 research assistants and technical staff. Professor Rupert Ormond of MCI is providing leadership and technical advice while also being responsible for implementing major elements of the programme.</p>
<p>Client reference contact details (Name, e-mail, address, phone number).</p>	<p>Dr Khalid Zubier, Faculty of Marine Science, King Abdul-Aziz University, Abdullah Sulayman, Jeddah 22254, Saudi Arabia Tel:</p>

Project Details

19. Project Outcome Statement: Describe what the project aims to achieve and what will change as a result. (50 words max)

The project determines key biological parameters for five threatened and keystone species of shark, grouper and snapper, and introduces measures to recover their abundance, so ensuring related fisheries are sustainable. Recovery of these populations also enhances the capacity of Cayman coral reefs, vital to tourism, to withstand climate change.

20. Background: (What is the current situation and the problem that the project will address? How will it address this problem? What key OT Government priorities and themes will it address? (200 words max)

Thanks to existing Marine Protected Areas (MPAs), coral reefs in Cayman have fared better than those in other Caribbean areas. Nevertheless due to climate and other impacts the abundance of living corals in Cayman is but a third of that originally present. Similarly, while globally the abundance on reefs of top predators, especially sharks, has collapsed, our recent OTEP project showed that in Cayman various sharks, grouper and snapper are still present, but with relative abundances markedly lower than expected. The protection of these apex predators is now considered critical since they play a keystone role in maintaining the balance of trophic cascades, so enhancing reef resilience. Yet our acoustic tagging studies revealed that top predators such as Caribbean reef sharks range over areas considerably larger than any one MPA, strengthening the argument, already developed through a study of algae-coral-herbivore interactions by a sister project (Darwin project: PI Turner), for an extension of existing MPAs. The present project will determine absolute abundance of keystone predators, quantify reproductive parameters, produce and implement Species Action Plans, and implement sustainable management of on-going fisheries. This effort will address the Cayman government's commitment to "Ensure the protection and restoration of key habitats and species".

21. Methodology: Describe the methods and approach you will use to achieve your intended outcomes and impact. Provide information on how you will undertake the work (materials and methods) and how you will manage the work (roles and responsibilities, project management tools etc). Give details of any innovative techniques or methods. (500 words max)

The project will determine key ecological and behavioural parameters for the management of 5 largest marine predators. These include oceanic-white tip shark and grey snapper considered by IUCN to be vulnerable, and tiger and Caribbean reef sharks considered near-threatened. The species also include tiger grouper as representative of the most important genera of commercial reef fish which appears in decline in Cayman. The resulting information will permit preparation of urgently required Species Action Plans and inform the refinement and enforcement of enhanced fisheries management plans. Data will also contribute to investigation of the mechanisms through these top predators influence the trophic balance and health of reef ecosystems. We will:

1. determine population abundance of 5 focal species through a) innovative High-definition Baited Remote Underwater Video Stations (BRUVS), allowing photo-identification of most individuals, b) diver-based distance sampling, a method yielding estimates of absolute abundance, c) conventional tagging with numbered tags, and d) application of mark-recapture methodology to derive area population estimates. (Gore)
2. quantify local patterns of movement for foraging and reproduction in relation to existing and potential MPA boundaries through a) acoustic tagging a total of 60 individuals (caught by scientific long-lining or trapping) and logging their movements using the established network of acoustic receivers around the islands, b) comparing abundances at different locations between seasons, and c) recording locations where identifiable individuals are re-recorded. (Gore)
3. investigate the reproductive biology of local populations through sampling gonads, monitoring suspected spawning sites and surveying potential nursery areas. (Gore)
4. assess the extent of population exchange with other Caribbean areas (and hence reliance of local populations on reproduction elsewhere) by a) DNA sequencing of mitochondrial genes in Caribbean reef sharks, tiger grouper and grey snapper, to compare with samples from other parts of the Caribbean (Shivji), and b) satellite tagging a total of 15 oceanic white-tip and tiger shark to quantify the extent of adult movement between the Caymans and other Caribbean areas (Harvey).

5. investigate the functional significance of top predators to the health of reefs by a) obtaining samples of gut contents through local fishers to confirm trophic links between these predators and their prey (Gore), and b) testing respective datasets for relationships between abundance and diversity of top predators and those of other reef fauna and flora. (Turner)

6. prepare Species Action Plans, informed by the data from the above studies. These will be directed at the 5 focal species, but also consider related genera and species recorded during sampling. (Ormond)

7. establish formal liaison groups with artisanal and recreational fishers, who will assist by recording catch data and retaining specimens of focal species. They will also advise on fisheries issues and be involved in subsequent co-management. (Ebanks-Petrie)

8. secure improved conservation measures through a separately funded combination of a) directed liaison with artisanal and recreation fishers, b) focussing of ongoing patrolling and enforcement activities, and c) public awareness campaigns directed at both fishers and general public. (Austin)

22. How does this project:

a) Deliver against the priority issues identified in the assessment criteria

b) Demonstrate technical excellence in its delivery

c) Demonstrate a clear pathway to impact in the OT(s)

(500 words max)

a) **Conformity with Priority Issues.**

This proposal straddles three priority funding areas. It will promote sustainable fisheries within Cayman, generating an ecosystem-based initiative that will increase the resilience of local reefs in the face of climate change.

The Cayman Islands adopted the CBD in 1992 and the subsequent Environment Charter (2001) included a commitment by the Cayman government (item 2) to “Ensure the protection and restoration of key habitats and species...” In addition the National Strategic Plan (Vision 2008) stated that the people wish “to protect the coral reefs of the Cayman Islands,” and the Cayman National Biodiversity Action Plan (2009) set a goal of “no net loss of biodiversity”, to be achieved through an approach including (2) the preservation of key individual species, through Species Action Plans (SAPs).

Currently there are 7 marine SAPs of which only 3 are for fish. There is one for the tourist industry-valued southern stingray, and one for the commercially important Nassau grouper, the only grouper to have been studied in Cayman. But SAPs for sharks remain pending due to lack of key information.

The project will deliver SAPs for the principal shark species in Cayman, plus two larger species, all of which are considered threatened. It will also deliver SAPs for representative species of grouper and snapper. The project will also initiate enhanced protection of these species, so promoting population recovery.

b) **Technical Excellence of Delivery.**

As in our other projects, the present proposal will embed good environmental decision making processes within the host country. Project staff will work alongside DoE collaborators. Data will be used to generate policy recommendations and SAPs which will be subject to public consultation and considered by the Minister or full cabinet.

The project will make use of cutting edge technologies: full gene sequencing to establish relationships between regional populations, innovative high-definition video to monitor the occurrence of recognisable individuals and state-of-the-art satellite tags to track the movement of larger sharks beyond Cayman waters. The underwater use of distance sampling and application of

photo-identification to BRUVS videos are both novel, but we have trialled these methods elsewhere.

Progress will be monitored and evaluated at meetings with senior DoE staff and reviewed at least annually by the Marine Conservation Board (composed of government representatives and stakeholders).

c) **Pathway to Impact in the OT.**

The Cayman DoE is demonstrating full-ownership of the project, having indicated the need for this work; it will contribute significant staff and resources (see section 33). Its capacity to deliver its contribution is beyond doubt given its commitment to previous OTEP and Darwin projects, and the extent of its staff and resources (see section 24).

Our OTEP project demonstrated the high economic value of living sharks to Cayman resulting from the influence of potential shark encounters on diving tourist decisions to select Cayman as a destination. The social and economic value of artisanal and recreational fisheries for grouper and snapper is also widely appreciated, and so the wider support of Cayman government and people anticipated.

23. Who are the **stakeholders** for this project and how have they been consulted (include local or host government support/engagement where relevant)? Briefly describe what support they will provide and how the project will engage with them. (250 words max)

The ultimate stakeholders are present and future generations of Caymanians, pre-eminent among whom will be tourism and fisheries sectors. At the end of our recent OTEP (shark and dolphin) project, we conducted a public consultation exercise which revealed overwhelming support for marine conservation measures. 92% of respondees were supportive of full protection of all sharks. But a minority of fishers remain to be persuaded of the need for conservation measures.

The proximal stakeholder is the Cayman Islands Department of Environment, which was closely involved in development of this proposal. Their staff will participate as follows:

Ebanks-Petrie (Director) policy development and advice (5% time)
Austin (Deputy Director) administrative support and fieldwork (10%)
Bothwell (research officer) fieldwork (15%)
Gibbs (research officer) fieldwork (15%)
Johnson (research officer) fieldwork (15%)
Olynik (GIS officer) GIS, fieldwork (15%)

The project is supported by two key bodies: 1) the Cayman Islands' Marine Conservation Board, composed of representatives of government, government agencies and other sectors, and 2) the Cayman Islands Tourist Association (CITA) Watersports Committee, including boating and diving operators. Project progress will be presented to these bodies at appropriate intervals.

The diving community participated in our recent OTEP project via an internet based network (now with 700 members) that will be maintained. Formal liaison groups will be established with artisanal and recreational fishers (as described above), while links will be sustained with the Angling Association, in response to whose request the grey snapper, a species in sharp decline in Cayman, is included among the focal species.

24. Institutional Capacity: Describe the implementing organisation's capacity (and that of partner organisations where relevant) to deliver the project.
(500 words max)

Marine Conservation International (MCI, www.marineconservationinternational.org) is a partnership formed by marine scientists to focus on high priority marine conservation objectives. It has offices in South Queensferry, Edinburgh. Its two directors are ex-senior UK university staff (York and London Universities) who currently hold honorary professorship and senior lectureship at Heriot-Watt University, Edinburgh. Ormond is past director of the Tropical Marine Research Unit at the University of York and the University Marine Biological Station at Millport. Gore completed education to PhD level in the Caribbean before working at a series of prestigious European Institutions. MCI possess its own boat for use in the UK, as well as a comprehensive range of field equipment. MCI's directors have between them completed over 100 projects in some 50 different countries (mostly in the Middle-East, Indian Ocean and Caribbean) with funding from governments, NGOs, grant-giving bodies and commercial organisations.

The Cayman Islands' Department of Environment (DoE), (www.doe.ky) is the Government agency responsible for management and conservation of environment and natural resources. It liaises with both government and stakeholders and manages the Marine Protected Area system. It has 10 marine research and assessment staff and 10 Marine Enforcement Officers, and a fleet of vehicles, 14 boats, 3 laboratories and diving facilities. It has the capacity to undertake much of the planned fieldwork, but lacks the financial resources and cutting edge research expertise to extend beyond existing programmes of mandatory monitoring and enforcement.

The Guy Harvey Ocean Foundation (www.guyharvey.com) is headquartered in Florida and founded by Cayman resident Guy Harvey. It supports inspired scientific research and innovative educational programs to help ensure that future generation can enjoy and benefit from a naturally balance marine ecosystem. Harvey is both an experienced scientist (with PhD from University of West Indies) and widely recognised as the world's finest marine wildlife artist. The Foundation funds the Guy Harvey Research Institute at Nova Southeast University (see below).

The School of Ocean Sciences, Bangor University (<http://www.bangor.ac.uk/oceansciences/>) is one of the principal marine science institutions in UK with an international reputation for its research on shelf seas and shallow marine environments. It has 28 academic staff and is correspondingly equipped, including its own ocean going research vessel. Several staff have expertise on reef ecosystems and fishes. In particular, Turner has undertaken research at numerous locations through the Indian and Atlantic Oceans, was PI of the Extended MPA Network Darwin Project in Cayman and is now PI of the corresponding Darwin Post Project.

Nova Southeast University Oceanographic Centre (<http://www.nova.edu/ocean/>) is a world leader in marine biological research. It has 20 academic staff and research teams housed in an ultra-modern facility at Fort Lauderdale, Florida. It contains the US National Coral Reef Institute as well as the Guy Harvey Research Institute and Save Our Seas Shark Center. The latter two (Director Shivji) research the Conservation Biology and Molecular Ecology of fishes and are well known for work on the genetic connectivity and diversity of sharks, rays and billfishes.

25. Expected Outputs

Output (<i>what will be achieved e.g. capacity building, action plan produced, alien species controlled</i>)	Indicators of success (<i>how we will know if its been achieved e.g. number of people trained/ trees planted</i>)	Status before project/baseline data (<i>what is the situation before the project starts?</i>)	Source of information (<i>where will you obtain the information to demonstrate if the indicator has been achieved?</i>)
1. Knowledge of local population size of	Survey and mark-recapture (sight-	Data for relative abundance of sharks,	Field data and analysis (to be included in 6

each focal species of apex predator	resight) data collected and analysed	but no estimates of area populations for any species	monthly reports or published papers)
2. Knowledge of movement patterns of apex predators	Acoustic & re-sightings data collected and analysed & movement patterns mapped	Some movement data for Caribbean reef shark. None for grouper or snapper.	Field data and analysis (to be included in 6 monthly reports or published papers)
3. Knowledge of reproductive biology of apex predators in Cayman	Data for spawning areas of grouper & snapper, and nursery areas all non-oceanic species	Good information available only for some other parts Caribbean. Some local knowledge.	Field data and analysis (to be included in 6 monthly reports or published papers)
4. Knowledge of population exchange with adjacent Caribbean	Samples collected and DNA sequenced; satellite tag data downloaded	Insufficient shark and no grouper or snapper tissue samples. Satellite tag data for a few sharks	Field data and analysis (to be included in 6 monthly reports or published papers)
5. Knowledge of functional interactions with other trophic groups	Gut samples inspected; statistical comparisons of abundance data completed	Some comparable studies of gut contents from other Caribbean locations	Field data and analysis (to be included in 6 monthly reports or published papers)
6. Species Action Plans (SAPs) for 5 marine apex predators	Draft and final SAPs prepared for each focal species	Cayman SAPs available for only 3 other marine species or groups	Publication of each SAP in hard copy and on internet
7. Establishment of Fisher Liaison Groups to assist with data collection	Fishers Liaison Groups established, workshops held, data & samples obtained	Divers & fishers have been surveyed in previous work. We established the existing diver network	Records of liaison group meetings or workshops. Catch data & samples available for inspection
8. Enhanced protection and stabilisation or recovery of target species	Monitoring indicates stable or recovering populations; reduced illegal fishing	Known relative abundance measures indicates low and likely declining populations	Field data and analysis (to be included in final report or published paper)

26. Expected Outcomes: How will each of the outputs contribute to the overall outcome of the project? (100 words max)

Outputs 1-5 constitute the information required to determine for each species the extent of decline, and assess whether the MPA system will be sufficient to protect them or additional measures (full protection, closed spawning / nursery areas or catch or size limits) be required.

This information will be incorporated in Species Action Plans (Output 6), while the fishers liaison groups (**Output 7**) will provide a mechanism for involving these critical stakeholders in sampling work and co-opting them in the implementation of improved fisheries management / conservation measures, resulting in both sustainable fisheries and greater reef resilience to climate change (Outcome).

27. Main Activities

Output 1	Population size (on Cayman reefs) of 5 marine apex predators
1.1	Deployment of high definition Baited Remote Underwater Video Stations (BRUVs) in study areas on Grand and Little Cayman Islands (minimum 56 stations repeated every 6 months)

1.2	Conduct diver-based distance sampling (minimum 14 stations) repeated every 6 months
1.3	Conventional tagging of Caribbean reef shark, tiger grouper and grey snapper, caught through scientific long-lining, trapping & fly-fishing (target 30 reef shark, 30 grouper, 30 snapper)
1.4	Application of mark-recapture modelling to data to determine effective population size in each study area

Output 2	Local movement patterns of 5 marine apex predators
2.1	Tagging with acoustic tags of tiger shark, Caribbean reef shark and tiger grouper (target 20 reef shark, 20 grouper, 20 snapper)
2.2	Re-sightings of individuals recognisable through numbered tags or distinctive patterning during regular sampling or observed by recreational divers or recapture by artisanal and recreational fishers.

Output 3	Knowledge of reproductive biology in Cayman
3.1	Collect samples of gonads to check for spawning / pupping seasons
3.2	Dive known and potential spawning aggregation sites (SPAGS) during likely spawning season to monitor use by tiger grouper and grey snapper
3.3	Survey potential grouper and snapper nursery areas (using small-scale band transects) to assess abundance of juveniles
3.4	Survey potential shark nursery areas using visual surveys and fishing to assess abundance of juveniles

Output 4	Population exchange with adjacent regions of Caribbean
4.1	Collection fin and tissue samples during tagging work and from participating artisanal & recreational fishers (target 15 oceanic white-tip and 5 tiger shark, 30 reef shark, 30 grouper, 30 snapper)
4.2	Sequence mitochondrial DNA for comparison with pre-existing samples of same species obtained from Florida and other Caribbean locations (sub-project lead: Shivji, Nova Southeastern University)
4.3	Tag with SPOT satellite tags at least 15 oceanic white-tip and 5 tiger sharks (sub-project lead: Harvey, Guy Harvey Ocean Foundation)

Output 5	Functional interactions of apex predators with other trophic groups
5.1	Retain and analyse gut samples of focal species when caught by artisanal and recreational fishers (target 30 grey snapper, 20 tiger grouper, plus small number sharks but only when caught unintentionally).
5.2	Co-analyse data for abundances of top predators and of lower trophic groups (smaller predators, herbivores, corals, algae) collected respectively by this project and the Bangor University / DoE Cayman project (sub-project lead: Turner)

Output 6	Establish & operate Fishers Liaison Groups
6.1	Establish formal liaison groups with artisanal & recreational fishers (separate for west and east Grand Cayman, and for Little Cayman).

6.2	Hold meetings & workshops to exchange knowledge and discuss common interests (target one every 6 months)
6.3	Prepare and distribute illustrated booklet on marine predators covering identification, biology, study methods and management (to be funded separately by Caybrew Ltd.)
6.4	Involve liaison group members in recording catch data and retaining representative specimens.

Output 7	Species Action Plans (SAPs) for 5 marine apex predators
7.1	Discuss management options & proposals with DoE, fisher liaison groups and other stakeholders
7.2	Prepare draft SAPs for 5 marine apex predators
7.3	Distribute draft SAPs for public consultation – this exercise will be publicised through the media with members of the public or representative organisations able to submit comments either as hard copy or on-line
7.4	Revise and finalise SAPs and submit to government

Output 8	Enhanced conservation and sustainable management of target species
8.1	Promote fishers awareness of SAPs and conservation measures via Fisher Liaison Groups
8.2	DoE patrol vessels to hail fishers vessels to check awareness and compliance
8.3	Wider public awareness programme: distribution of posters and release information via internet and media (to be funded separately by Caybrew Ltd.)
8.4	Continue monitoring using BRUVs, underwater distance sampling and fishers catch data, to assess on-going population trends

28. Risks			
Description of the risk	Likelihood the event will happen (H/M/L)	Impact of the event on project (H/M/L)	Steps the project will take to reduce or manage the risk
Shortage of accommodation at DoE guest house in Grand Cayman	M	M	Field work phasing adjusted to avoid peak demand. Project can also operate from DoE guest house in Little Cayman.
Insufficient interns available to assist with fieldwork	L	M	Maintain contact with Heriot-Watt, York and Bangor Universities, from which recent MSc students likely available.
Poor weather will limit amount of fieldwork that can be completed	L	M	Extended fieldwork seasons (2 x 3 months) in each of 2 years will limit risk. Long-term marine forecasts will be used to plan weekly schedules.
Shortage of boats and vehicles in Cayman	L	M	DoE Cayman currently have more than sufficient boats and vehicles and a dedicated 4-man maintenance team.

29. Sustainability: How will the project ensure benefits are sustained after the project has come to a close? If the project requires ongoing maintenance or monitoring, who will do this? (200 words max)

At least 6 DoE Cayman staff will be involved in the project (Ebanks-Petrie, Austin, Johnson, Olynik, Bothwell, Gibbs), with at least three involved in policy development, and all save the first assisting in fieldwork. This will provide staff with the skills and knowledge required to sustain monitoring and policy development. The Species Action Plans and related conservation measures will be integrated into ongoing fisheries management activities, with restrictions enforced through the DoE's separate existing 8-man marine patrol team. It is anticipated that the Fisher Liaison Groups and diver network will both be maintained. Divers are expected to continue reporting sightings to the DoE and Facebook web-pages, and fishers will also be encouraged to continue contributing. It is anticipated that some sponsors (Caybrew, GHOF) will continue to support some activities into the future.

30. Monitoring & Evaluation: How will the project be monitored and who will be responsible? Will there be any independent assessment of progress and impact? When will this take place, and by whom? (250 words max)

Progress towards the project outcome of stable or recovering fish stocks will be monitored by basic survey work in both 2014 and 2015 to determine whether population densities appear to be recovering, declining or stable. Counts of sharks will also be compared with data from the previous OTEP project. However significant population recovery of species with a low reproductive capacity cannot be anticipated until this project has been completed.

Dr. Gore (PI) will provide overall management of the project and prepare 6 monthly reports in consultation with project partners. In Cayman she will be based in the DoE offices and liaise informally with the Deputy-Director (Austin) on an almost daily basis.

Prof. Ormond will be responsible for project strategy and quality within MCI.

Project progress will be reviewed every approximately two months at formal meeting with the Director (Ebanks-Petrie) and Deputy-Director (Austin) of the Cayman DoE.

Prof. Callum Roberts, Environment Department, University of York, will provide formal **independent** evaluation of project progress, based on the 6 monthly reports and a mid-project visit to Cayman.

Prof. Shivji will advise on the undertaking and interpretation of the DNA sequencing work (at Nova-SE or other institute).

Details of progress will be presented for discussion to the DoE's Marine Conservation Board (consisting of 6 appointed and elected members) at the start, mid-point and towards the end of the project.

The project completion report is after the project is over and is linked to the final payment.

31. Financial controls: Please demonstrate your capacity to manage the level of funds you are requesting. (Who is responsible for managing the funds? What experience do they have? What arrangements are in place for auditing expenditure?)

Dr. Gore (PI) will be responsible for the day to day management of funds; she has previously managed several projects of similar size.

As with previous projects all project funds will be processed through a dedicated bank account, and wherever possible payment will be by debit or credit card or bank transfer, to ensure transparency.

Prof. Ormond will be responsible for regular summary accounts which, as for other recent projects, will be audited by MCI's accountants – the A9 Partnership.

Sufficient funds to cover the cost of auditing have been included within the budget.

Please complete the separate Excel spreadsheet which provides the Budget for this application. Some of the questions earlier and below refer to the information in this spreadsheet.

NB: Please state all costs by financial year (1 April to 31 March) and in GBP. **Budgets submitted in other currencies will not be accepted.** Use current prices – and include anticipated inflation, as appropriate, up to 3% per annum. The Darwin Initiative cannot agree any increase in grants once awarded.

33. Value for Money

Please explain how you worked out your budget and how you will provide value for money through managing a cost effective and efficient project. You should also discuss any significant assumptions you have made when working out your budget. (200 words max)

- a) A very experienced project officer (Gore) will be employed on a 75% basis.
- b) UK based MSc level interns will assist with fieldwork phases.
- c) 6 Cayman DoE staff will contribute 5-15% of their time to fieldwork, data analysis, policy development and liaison with fishers without cost.
- d) Boats, vehicles, fuel, diving and office facilities will be provided by Cayman DoE without charge.
- e) 4 highly experienced professorial staff (Ormond – Heriot-Watt, Harvey – GHOF, Turner – Bangor, and Shivji – Nova SE) will input time unsalaried.
- f) Local divers will contribute data without cost.
- g) Local fishers will contribute specimens at minimal cost.
- h) Caybrew (local brewery) is sponsoring the project through a 5% levy on our conservation beer “White Tip” lager.
- i) Guy Harvey Ocean Foundation will fund a portion of the satellite tags that they expect to deploy.
- j) The project will employ novel and cutting edge techniques: modern population genetics, satellite tags, underwater distance sampling and underwater photo-identification.
- k) The project provides a unique opportunity (because of the extent of data collected by different local projects) to relate the abundance of apex predators to the health of other reef fauna and flora.

Provide a project implementation timetable that shows the key milestones in project activities. Complete the following table as appropriate to describe the intended workplan for your project (Q1 starting April 2014)

Activity	No of Months	Year 1				Year 2			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Output 1 Knowledge of population size of 5 marine apex predators									
1.1 Deployment of high definition Baited Remote Underwater Video Stations (BRUVS)	12	X		X		X		X	
1.2 Diver-based Distance Sampling of representative reef areas	12	X		X		X		X	
1.3 Conventional tagging of fish caught through scientific long-lining & trapping	12	X		X		X		X	
1.4 Application of mark-recapture models to determine population size	4				X		X		X
Output 2 Knowledge of individual movement patterns of 5 apex marine predators									
2.1 Tagging with acoustic tags of 20 reef shark, 20 grouper & 20 snapper	12	X		X		X		X	
2.2 Recapture of conventionally tagged fish during scientific long-lining & trapping	12	X		X		X		X	
2.2 Re-sightings of individuals during distance sampling surveys and by participating recreational divers.	8			X	X	X	X	X	X
Output 3 Knowledge of reproductive biology in Cayman									
3.1 Collect samples of gonads to determine breeding seasons	12	X	X	X	X	X	X		
3.2 Investigate use of potential spawning aggregation sites (SPAGS) by tiger grouper and grey snapper	8	X	X			X	X		
3.3 Survey potential grouper and snapper nursery areas (through visual surveys & netting)	8		X	X	X	X	X		
3.4 Survey potential shark nursery areas using visual surveys and fishing to assess abundance of juveniles	8		X	X	X	X	X		

Output 4	Knowledge of population exchange with adjacent areas									
4.1	Collect fin and tissue samples during tagging work and from participating artisanal & recreational fishers	18		X	X	X	X	X	X	
4.2	Sequence mitochondrial DNA for comparison with samples of same species from other Caribbean locations	8					X	X	X	X
4.3	Tag with SPOT satellite tags at least 15 oceanic whitetip and 5 tiger sharks	12	X	X	X	X	X	X		
4.4										
Output 5	Functional interactions of marine apex predators with other trophic groups									
5.1	Collect gut samples of focal species mainly through artisanal and recreational fishers	18		X	X	X	X	X	X	
5.2	Co-analyse (with Bangor Darwin Project staff) data for abundances of top predators and of lower trophic groups	6			X	X		X		X
5.3										
Output 6	Establish & Operate Fishers Liaison Groups									
6.1	Establish formal liaison group with artisanal & recreational fishers	2	X							
6.2	Hold meetings & workshops to exchange knowledge and discuss common interests	8		X		X		X		X
6.3	Prepare and distribute illustrated booklet on marine predators for use by fishers	8		X		X	X			
6.4										
Output 7	Develop and Publish Species Action Plans (SAPs) for 5 marine apex predators (with reference to related species)									
7.1	Discuss fisheries management options with DoE and Fishers Liaison Groups and other stakeholders.	4			X	X				
7.2	Prepare draft SAPs for 5 apex predators	4			X	X				

7.3	Distribute draft SAPs for public consultation, publicising via media and collected responses via hard copy and web-based questionnaire	3				X				
7.4	Revise & finalise SAPs and submit to government.	1				X				
7.5										
Output 8	Enhanced conservation and fisheries management of marine apex predators									
8.1	Promote awareness and understanding of SAPs among fishers	12					X	X	X	X
8.2	DoE patrol vessels increase interaction with fishers vessels to check awareness and compliance	9					X	X	X	
8.3	Wider public awareness programme: distribution leaflets and posters and release of information via media	9					X	X	X	
8.4	Continued monitoring (BRUVs, underwater distance sampling & catch data) to assess on-going trends	6							X	X

CERTIFICATION

On behalf of the trustees/company* **Marine Conservation International**
(*delete as appropriate)

I apply for a grant of £173,439 in respect of **all expenditure** to be incurred during the lifetime of this project based on the activities and dates specified in the above application.

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful. (*This form should be signed by an individual authorised by the lead institution to submit applications and sign contracts on their behalf.*)

I enclose CVs for project principals and letters of support.

Our most recent audited/independently verified accounts and annual report are also enclosed/can be found at (delete as appropriate):

Name (block capitals)	Dr. Mauvis Gore
Position in the organisation	Co-Director

Signed



Date:

30/07/2014

Application Checklist for submission

	Check
Have you read the Guidance Notes ?	√
Have you checked the Darwin Plus website immediately prior to submission to ensure there are no late updates?	√
Have you provided actual start and end dates for your project?	√
Have you provided your budget based on UK government financial years ie 1 April – 31 March and in GBP?	√
Have you checked that your budget is complete , correctly adds up and that you have included the correct final total on the top page of the application?	√
Has your application been signed by a suitably authorised individual? (clear electronic or scanned signatures are acceptable in the email)	√
Have you included a 1 page CV for all the principals ?	√
Have you included a letter of support from the <u>main</u> partner(s) organisations?	√
Have you included a copy of the last 2 years' annual report and accounts for the lead organisation? An electronic link to a website is acceptable.	√

Once you have answered the questions above, please submit the application, not later than midnight GMT Monday 4 August 2014 to Darwin-Applications@ltsi.co.uk using the first few words of the project title **as the subject of your email**. If you are e-mailing supporting documentation separately please include in the subject line an indication of the number of e-mails you are sending (e.g. whether the e-mail is 1 of 2, 2 of 3 etc). You are not required to send a hard copy.

DATA PROTECTION ACT 1998: Applicants for grant funding must agree to any disclosure or exchange of information supplied on the application form (including the content of a declaration or undertaking) which the Department considers necessary for the administration, evaluation, monitoring and publicising of Darwin Plus. Application form data will also be held by contractors dealing with Darwin Plus monitoring and evaluation. It is the responsibility of applicants to ensure that personal data can be supplied to the Department for the uses described in this paragraph. A completed application form will be taken as an agreement by the applicant and the grant/award recipient also to the following: - putting certain details (i.e. name, contact details and location of project work) on the Darwin Initiative and Defra/FCO/DFID websites (details relating to financial awards will not be put on the websites if requested in writing by the grant/award recipient); using personal data for the Darwin Initiative postal circulation list; and sending data to Governor's Offices outside the UK, including posts outside the European Economic Area. Confidential information relating to the project or its results and any personal data may be released on request, including under the Environmental Information Regulations, the code of Practice on Access to Government Information and the Freedom of Information Act 2000.